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DT04 Rec'd PCT/PTO 04 OCT 2004

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-38 (canceled)

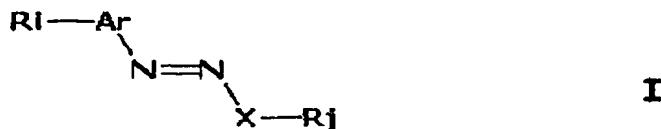
39. (new) Photosensitive adhesive composition of polymerizable resin type whose hardening is obtained by polymerization and/or cross-linking **characterized** in that said composition contains:

- means for initiating at least one chain polymerization reaction in order to ensure hardening of said composition, and
- a sufficient quantity of at least one bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre so that said hardened composition loses its integrity and adhesiveness under the action of uncrosslinking radiation which causes cleavage of the photocleavable units.

40. (new) Adhesive composition as in claim 39 **characterized** in that the initiation means for chain polymerization reaction(s) are photoinitiating means consisting of at least one photoinitiator able to initiate the polymerization reaction mechanism under the action of crosslinking radiation whose wavelength  $\lambda_1$  is different to wavelength

$\lambda_2$  for uncrosslinking radiation.

41. (new) Adhesive composition as in claim 39, characterized in that the photocleavable unit(s) of the photocleavable centre are aryl-diazos units defined by formula I:



in which:

- Ar designates an aromatic system, monocyclic or polycyclic, carbocyclic or heterocyclic, including atoms such as S or N in particular, each cycle preferably comprising 5 or 6 atoms, and is the remainder of an aromatic amine,
- X designates an atom chosen from among: C, O, P, S;
- Ri is one or more of the following groups: hydrogeno, halogeno, alkyl linear or branched, saturated or unsaturated, optionally substituted, aryl aromatic or heteroaromatic, substituted or unsubstituted, alcoxy such as methoxy for example or ethoxy, aryloxy, alkylthio, arylthio, benzyl, halogeno, hydroxy, hydroxyalkyl, thiol, alkyloxycarbonyl, aryloxycarbonyl, cyano, carbonyl, formyl, amino, carboxylic and sulfonic ester, carboxylic sulfonic and phosphoric amide, carboxylic sulfonic and phosphoric acid, sulfonate, phosphonate, -OCONR'R'' group, -OCO<sub>2</sub>R', -OSO<sub>2</sub>R', -OPOOR'OR'', -R'NHCOOR'', -R'OCO<sub>2</sub>R'', -NR'R'' (in which R' and R'' represent an alkyl group, carbocyclic or heterocyclic group, aliphatic, unsaturated, (hetero-)aromatic group, all substituted or

unsubstituted, imine whether substituted or not, nitro, -N=N-R', -Rp-Si-(ORq)<sub>3</sub> group (in which Rp is a hydrocarbon chain, preferably a linear alkyl chain comprising at least 3 C atoms, and Rq denotes a hydrogen atom, a hydroxy group, C<sub>1</sub>-C<sub>6</sub> alcoxy chain or -(Si(ORq) group), vinyl group, acrylic group, alcoxycarbonyl group, an aryltriazene group,

- Rj designates one or more substituents depending upon the valency of the atom designated by X, the same or different and chosen from among: an alkyl chain linear or branched, saturated or unsaturated, acyclic or cyclic, optionally substituted; an aromatic or heteroaromatic group including, for example in a preferred chain of 5 or 6 atoms, at least one nitrogen or sulfur atom, monocyclic or polycyclic; an alcoxy, aryloxy chain or benzyl group.

42. (new) Adhesive composition as in claim 41, **characterized** in that X designates P and in that the photocleavable unit(s) of the photocleavable centre are arylazophosphonate units Ar-N=N-PO(OR') (OR''), in which R' and R'' are independently chosen from among: an alkyl chain linear or branched, substituted or unsubstituted, (un)saturated, (a)cyclic, carbocyclic or heterocyclic, a (hetero)-aromatic radical, more particularly a hydroxyethyl chain, 1,4- or 1,3-dimethyl cyclohexyl, 1,4-dimethylparaphenyl, a methyl, ethyl, propyl, isopropyl, hydroxyethyl, cyanoethyl, acryloxyethyl group, ether of alkyl(C<sub>1</sub>-C<sub>6</sub>)glycidyl or alkyl(C<sub>1</sub>-C<sub>6</sub>)vinyl, cyclohexyl epoxy.

43. (new) Adhesive composition as in claim 41, **characterized** in that X designates S and in that the photocleavable unit(s) of the

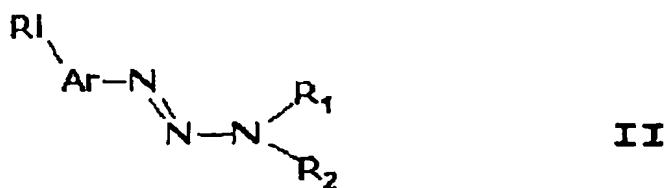
photocleavable centre are arylazosulfonates Ar-N=N-SO(OR') (OR''), R' and R'' being independently chosen from among: an alkyl chain linear or branched, substituted or unsubstituted, (un)saturated, (a)cyclic, carbocyclic or heterocyclic, a (hetero)-aromatic radical, more particularly a hydroxyethyl chain, 1,4- or 1,3-dimethyl cyclohexyl, 1,4-dimethylparaphenyl, a methyl, ethyl, propyl, isopropyl, hydroxyethyl, cyanoethyl, acryloxyethyl group, ether of alkyl(C<sub>1</sub>-C<sub>6</sub>)glycidyl or alkyl(C<sub>1</sub>-C<sub>6</sub>)vinyl, cyclohexyl epoxy.

44. (new) Adhesive composition as in claim 41, **characterized** in that X designates S and in that the photocleavable unit(s) of the photocleavable centre are arylazosulfone units Ar-N=N-SO<sub>2</sub>R', R' being independently chosen from among: an alkyl chain linear or branched, substituted or unsubstituted, (un)saturated, (a)cyclic, carbocyclic or heterocyclic, a (hetero)-aromatic radical, more particularly a hydroxyethyl chain, 1,4- or 1,3-dimethyl cyclohexyl, 1,4-dimethylparaphenyl, a methyl, ethyl, propyl, isopropyl, hydroxyethyl, cyanoethyl, acryloxyethyl group, ether of alkyl(C<sub>1</sub>-C<sub>6</sub>)glycidyl or alkyl(C<sub>1</sub>-C<sub>6</sub>)vinyl, cyclohexyl epoxy.

45. (new) Adhesive composition as in claim 41, **characterized** in that X designates S and in that the photocleavable unit(s) of the photocleavable centre are arylazosulfide units AR-N=N-S-R', R' being independently chosen from among: an alkyl chain linear or branched, substituted or unsubstituted, (un)saturated, (a)cyclic, carbocyclic or heterocyclic, a (hetero)-aromatic radical, more particularly a hydroxyethyl chain, 1,4- or 1,3-dimethyl cyclohexyl, 1,4-dimethylparaphenyl, a methyl, ethyl, propyl, isopropyl, hydroxyethyl,

cyanoethyl, acryloxyethyl group, ether of alkyl(C<sub>1</sub>-C<sub>6</sub>)glycidyl or alkyl(C<sub>1</sub>-C<sub>6</sub>)vinyl, cyclohexyl epoxy.

46. (new) Adhesive composition as in claim 39 characterized in that the photocleavable unit(s) of the photocleavable centre are aryl-triazene units defined by formula II:



in which:

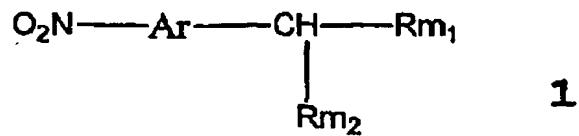
- Ar designates an aromatic system monocyclic or polycyclic, carbocyclic or heterocyclic, including in particular atoms such as S or N, each cycle preferably having 5 or 6 atoms and is the remainder of an aromatic amine,

- R<sub>i</sub> is chosen from among the following groups: alkyl linear or branched, saturated or unsaturated, optionally substituted, aryl aromatic or heteroaromatic, substituted or unsubstituted, alcoxy such as methoxy for example or ethoxy, aryloxy, alkylthio, arylthio, benzyl, halogeno, hydroxy, hydroxylalkyl, thiol, alkyloxycarbonyl, aryloxycarbonyl, cyano, carbonyl, formyl, amino, carboxylic and sulfonic ester, carboxylic sulfonic and phosphoric amide, carboxylic sulfonic and phosphoric acid, sulfonate, phosphonate, -OCONR'R'', group or -OCO<sub>2</sub>R', -OSO<sub>2</sub>R', -OPOOR'OR'', -R'NHCOOR'', -R'OCO<sub>2</sub>R'', -NR'R'' (in which R' and R'' represent an alkyl group, a carbocyclic or heterocyclic group, aliphatic, unsaturated, a (hetero-)aromatic

group, all substituted or unsubstituted, imine substituted or unsubstituted, nitro,  $-N=N-R'$ ,  $-R_p-Si-(OR_q)_3$  group ( $R_p$  and  $R_q$  as defined in claim 3), a vinyl group, acrylic group, alcoxycarbonyl group, an aryltriazene group,

-  $R_1$  and  $R_2$  are chosen independently from one another, a  $-N=N-R'$  group,  $-NR'-N=N-R''$  group, OH group,  $NR'R''$  group, ( $R'$  and  $R''$  have the previously given denotations), an alkyl group such as methyl, ethyl, propyl, isopropyl, butyl, tert-butyl, an alkoxy group substituted or not, a benzyl group, a (hetero)-aromatic group, all substituted or not by substituents of  $R_i$  type, a hydroxyethyl, cyanoethyl, aminoethyl, acryloxyethyl, halogenoethyl group.

47. (new) Adhesive composition as in claim 39, characterized in that the photocleavable unit(s) of the photocleavable centre are 2-nitrobenzyl units having the formula 1:



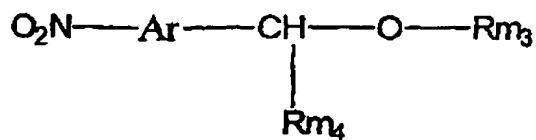
in which:

- $Ar$  designates an aromatic or heteroaromatic radical (including an atom such as N or S for example) monocyclic or polycyclic and carrying at least one  $R_k$  substituent
- $R_k$  designates an auxochromic or bathochromic substituent which may be chosen from the following examples: hydrogen, halogen, alkyl chain, aliphatic acyclic saturated or unsaturated, linear or branched, a cyclic, aliphatic, unsaturated, aromatic or

heteroaromatic radical preferably having 5 to 14 atoms, preferably 5 to 6, these chains and radicals possibly being substituted, interrupted or terminated by a heteroatom such as B, N, O, Si, P, S or a halogen, a nitro group, cyano group, an alcoxy, aryloxy, alkylthio, arylthio, benzyl, aylalkyl, hydroxy, thiol, alkyloxycarbonyl, aryloxycarbonyl, carbonyl, formyl, amino radical, carboxylic ester, amide, sulfonic ester, sulfonic amide, carboxylic acid, sulfonic acid, sulfonate, phosphonate, a -OCONR'R'' group, -OCO<sub>2</sub>R', -OSO<sub>2</sub>R', -OPOOR'OR'', -R'NHCOOR'', R'OCO<sub>2</sub>R'', NR'R'' (R' and R'' are an alkyl, aryl group, a carbocyclic or heterocyclic group), imine substituted or unsubstituted, diazo -N=N-R', -Rp-Si(ORq)<sub>3</sub> group (Rp and Rq as defined in claim 3), alkylglycidyl ether, alkylvinyl ether, cyclohexyl epoxy.

- R<sub>m1</sub>/R<sub>m2</sub> are independently chosen from among: a hydrogen, an alkyl, alcenyl, alcynyl, alkylaryl chain, all substituted or unsubstituted, preferably C1-C6, a carbocyclic or heterocyclic chain saturated or unsaturated, aromatic or heteroaromatic, substituted or unsubstituted, preferably having 5 to 6 atoms, an alcoxy, aryloxy, alkylthio, arylthio chain, an alkyloxocarbonyl group, -NR'COR'' group, -OCOR' group, -OCOOR' group, -OCONR'R'' group, NR'COOR'' group, -OPOR'R''R''' group, -OSO<sub>2</sub>R' group, -OPOOR'OR'' group, -NR'R'', -COOR' group, -CONR'R'', SOOR', -COR' group (R', R'' and R''' have the previously indicated denotations for R' and R''), an imine group substituted or unsubstituted, a hydroxy, thiol group, a carboxylic acid or derivative of carboxylic acid, a halogen, a nitrile, an alkyl(C1-C6)glycidyl ether group, alkyl(C1-C6)vinyl ether group, cyclohexyl epoxy, -Rp-Si-(ORq)<sub>3</sub> group (Rp and Rq as previously defined).

48. (new) Adhesive composition as in claim 39, characterized in that the photocleavable unit(s) of the photocleavable centre are 2-nitrobenzyl units defined by formula 2:

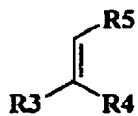


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in which:

- Ar is as defined in claim 9,
- R<sub>m4</sub> is defined as Rm1/Rm2 in claim 9,
- R<sub>m3</sub> is chosen from among a hydrogen, an alkyl, alcenyl, alcynyl, alkylaryl chain, all substituted or unsubstituted, interrupted by a heteroatom such as N, O, P, Si, S, preferably C<sub>1</sub>-C<sub>6</sub>, a carbocyclic or heterocyclic chain, saturated or unsaturated, aromatic or heteroaromatic, substituted or unsubstituted, preferably having 5 to 14 atoms, preferably 5 to 6, an alkyloxocarbonyl group, NCOOR' group, -POR'R''R''' group, -SO<sub>2</sub>R' group, -POOR'OR'' group, -COOR' group, -CONR'R'', COR' group (R', R'' and R''' having the previously indicated denotations for R' and R'' in claim 9), an alkyl(C<sub>1</sub>-C<sub>6</sub>)glycidyl ether group, alkyl(C<sub>1</sub>-C<sub>6</sub>)vinyl ether group, cyclohexyl epoxy, -Rp-Si(ORq)<sub>3</sub> group (Rp and Rq as defined in claim 3).

49. (new) Composition as in claim 39, characterized in that the polymerizable units of the bifunctional monomer are radically polymerizable and are vinyl groups defined by formula IV:



in which R3, R4, R5 are substituents able to activate together the double vinyl bond vis-à-vis radical addition chain reactions, at least one of said substituents being a hydrocarbon chain advantageously a C1-C6 alkyl chain.

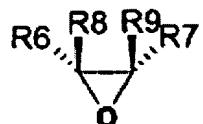
50. (new) Composition as in claim 49, **characterized** in that at least one of the substituents R3, R4 and R5 is chosen from among the groups: aryl, carbonyloxyalkyl, carbonyloxyaryl, carboxy (-COOH), alcoxy-carbonyl (-O<sub>2</sub>CR), carbamoyl (-CONR<sub>2</sub>) and cyano.

51. (new) Composition as in claim 40, **characterized** in that said composition comprises at least two types of complementary vinyl units, capable of creating a charge transfer complex (electron donor/acceptor pair) itself able to initiate a radical reaction under the action of crosslinking radiation of wavelength  $\lambda_1$ , or at least one type of acceptor vinyl unit able to create a charge transfer with another complementary species.

52. (new) Composition as in claim 51, **characterized** in that the donor vinyl unit is chosen from among the elements: styrene, vinyl acetate, vinyl ether, exomethylene dioxolane in particular 4-methylene-2-phenyl-1,3-dioxolane, alkyl methacrylate, vinyl pyrrolidone, vinyl carbazole, vinyl naphthalene, while the vinyl unit

of acceptor type is chosen from among the elements: maleic anhydride, acrylonitrile, diethyl fumarate, fumaronitrile, maleimides.

53. (new) Composition as in claim 38, **characterized** in that the polymerizable units of the bifunctional monomer are cationically polymerizable and are oxirane groups defined by formula V:

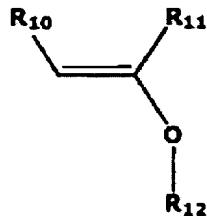


in which at least one of the substituents R6, R7, R8, R9 is a hydrocarbon chain and are chosen from among a hydrogen atom, halogen atom, an alkyl, alcoxy, alkylthio chain linear or branched, saturated or unsaturated, acyclic or cyclic, preferably C1-C6, optionally substituted, optionally interrupted by a heteroatom, an aromatic or heteroaromatic aryl group, an aryloxy or arylthio group preferably having 5 to 6 atoms, a benzyl group, imine group, amino NR'R'', SiR'R''R''', alkyl(C1-C6)oxycarbonyl, aryl(C1-C6)oxycarbonyl, amide, carboxylic and sulfonic ester, sulfonate, phosphonate, a carbonyl group, cyano, -OCONR'R'' group, -OCO<sub>2</sub>R' group, -OSO<sub>2</sub>R' group, -OPOOR'OR'' group, -R'NHCOOR'', R'OCO<sub>2</sub>R'' in which R, R', R'' represent an alkyl group (preferably C<sub>1</sub>-C<sub>6</sub>) substituted or unsubstituted, aryl (preferably having 5 to 6 atoms), carbocyclic or heterocyclic group, aliphatic, unsaturated or aromatic, substituted or unsubstituted.

54. (new) Composition as in claim 53, **characterized** in that, for reasons of steric hindrance, two of the substituents R6, R7, R8,

R9 are a hydrogen atom.

55. (new) Composition as in claim 39, characterized in that the polymerizable units of the bifunctional monomer are cationically polymerizable and are vinyl ethers defined by formula VI:



in which:

- R10 and R11 are the same or different and designate a hydrogen atom or advantageously a linear or branched C<sub>1</sub>-C<sub>6</sub> alkyl chain, substituted or not, saturated or unsaturated, acyclic or cyclic, optionally interrupted by a heteroatom such as O, N, Si, P for example, an aromatic or heteroaromatic aryl group (preferably having 5 to 6 atoms), an alcoxy chain (preferably C1-C6), alkylthio chain (preferably C<sub>1</sub>-C<sub>6</sub>), arylthio (preferably having 5 to 6 atoms).

- R12 advantageously designates a linear or branched C<sub>1</sub>-C<sub>6</sub> alkyl chain, substituted or not, saturated or unsaturated, acyclic or cyclic, optionally interrupted by a heteroatom such as O, N, S, Si, P for example, an aromatic or heteroaromatic aryl group (preferably having 5 to 6 atoms).

56. (new) Composition as in claim 39, characterized in that the bifunctional monomer is of oligomer or prepolymer size and has a comb

branch structure, consisting of a principal linear polymer chain of which each of the comb branches contains at least one photocleavable unit positioned on the side of the principal chain and at least one polymerizable unit positioned at the free end of the branch.

57. (new) Composition as in claim 56, **characterized** in that the comb branches contain a photocleavable unit and a polymerizable unit.

58. (new) Composition as in claim 39, **characterized** in that the bifunctional monomer is of oligomer or prepolymer size and has a hyperbranched structure.

59. (new) Composition as in claim 58, **characterized** in that the bifunctional monomer with hyperbranched structure is synthesized from a precursor monomer of  $AB_2$  or  $AB_3$  type, in particular under a polycondensation or polyaddition mechanism.

60. (new) Adhesive composition as in claim 58, **characterized** in that the hyperbranched structure has a core comprising photocleavable units, and a peripheral shell consisting of inert units from a photochemical viewpoint.

61. (new) Adhesive composition as in claim 58, **characterized** in that the hyperbranched structure has a core consisting of photochemically inert units, and a peripheral shell containing photocleavable units.

62. (new) Adhesive composition as in claim 49, **characterized** in

that the bifunctional monomer is 1,5-bis[4'-(methacryloylmethyl)phenylazomethyl-phosphonate]-diethylene glycol.

63. (new) Adhesive composition as in claim 53, **characterized in** that the bifunctional monomer is: 1,5-bis[4'-methyl glycidyl ether)phenylazomethylphosphonate]-diethylene glycol.

64. (new) Adhesive composition as in claim 49, **characterized in** that the bifunctional monomer is chosen from: 1,2-Bis[1-(4'-(methacryloylmethyl-)phenyl-3-methyl] triaz(1)ene-ethane; 1,2-Bis[1-(4'-(methacryloylethyl) aminocarbonyloxymethyl)phenyl-3-methyl-] triaz(1)ene-ethane;  
1-(4'-(methacryloylmethyl-) phenyl-3-(2''-(methacryloylethyl)-3-methyl-triaz(1)ene; 1-(4'-(methacryloylethyl) aminocarbonyloxymethyl)phenyl-3-((methacryloylethyl) aminocarbonyloxyethyl) -3-methyl-triaz(1)ene;  
1-(4'-(methacryloylmethyl-)phenyl-3,3-di(2''-(methacryloylethyl) -triaz(1)ene; 1-(4'-(methacryloylethyl) aminocarbonyloxymethyl)phenyl-3,3-di((methacryloylethyl) aminocarbonyl oxyethyl)-triaz(1)ene; 1-(3'-(methacryloylethyl carboxyphenyl)-3-di(2''-(methacryloylethyl)triaz(1)ene; 1,2-Bis[1-(3'-(methacryloylethylcarboxyphenyl)-3-methyl]triaz(1)ene-ethane; 2-methacryloylmethyl-5-(3'-(2''-(methacryloylethyl)-3'-methyl)triaz(1)ene-thiophene.

65. (new) Adhesive composition as in claim 53, **characterized in** that the bifunctional monomer is chosen from among: 1-(3'-ethyl glycidyl ether carboxyphenyl)-3-(ethyl glycidyl ether)-3-methyl-

triaz(1)ene, 1-(3'-ethyl glycidyl ether carboxy-6'-methylphenyl)-3-(ethyl glycidyl ether)-3-methyl-triaz(1)ene; 1-(4'methyl glycidyl ether)-3-(ethyl glycidyl ether)-3-methyl-triaz(1)ene.

66. (new) Adhesive composition as in claim 49, **characterized in** that the bifunctional monomer is chosen from: 2-Methyl-acrylic acid 5-methoxy-4-[2-(2-methyl-acryloyloxy)-ethoxy]-2-nitro-benzyl ester; 2-Methyl-acrylic acid 1-(5-methoxy-4-[2-methyl-acryloyloxy)-ethoxy]-2-nitro-phenyl)-ethyl ester; 2-Methyl-acrylic acid 4,5-bis-[2-(2-methylacryloyloxy)-ethoxy]-2-nitro-benzyl ester; 2-Methyl-acrylic acid 2-(5-methoxy-4-(2[2-(2-methyl-acryloyloxy)-ethoxycarbonyloxy]-ethoxy)-2-nitro-benzoxycarbonyloxy)-ethyl ester.

67. (new) Adhesive composition as in claim 53, **characterized in** that the bifunctional monomer is chosen from among: 2-[2'nitro-4',5'-di(oxymethyloxirane)]benzyloxymethyl oxirane; (2-Methoxy-5-nitro-4-oxiranylmethoxymethyl-phenoxy)-acetic acid oxiranylmethyl ester.

68. (new) Adhesive composition as in claim 56, **characterized in** that the bifunctional monomer is chosen from:

- Poly[(14-(2'-aminoacylethyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(2'-4'-aminoacylethyl)-1,4-dioxa-5-oxo-6-aza-heptane)],
- Poly[(14-(4'-aminoacylhexyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-aminoacylhexyl)-1,4-dioxa-5-oxo-6-aza-heptane)],
- Poly[(14-(4'(4''-aminoacylphenyl)methylphenyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-(4''-aminoacylphenyl)methylphenyl)-1,4-dioxa-5-oxo-6-aza-heptane)],

- Poly[(14-(4'-(4''-aminoacylcyclohexyl)methylcyclohexyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-(4''-aminoacylcyclohexyl)methylcyclohexyl)-1,4-dioxa-5-oxo-6-aza-heptane)],
- Poly((14-(4'-methylaminoacylcyclohexyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-methylaminoacylcyclohexyl)-1,4-dioxa-5-oxo-aza-heptane)],
- Poly[(14-(4'-aminoacylbutyl)-6-(hydroxymethyl)-1,4,8,11-tetraoxa-12-oxo-13-aza-tetradecane)-co-(7-(4'-aminoacylbutyl)-1,4-dioxa-5-oxo-6-aza-heptane)]

in which all these polymers are esterified on the hydroxy group at position 6 of the copolymer chain by groups of type:

- -oxycarbonyl-3-[3'-(2''-(methacrylate)ethyl))-3'-methyl-triazene]phenyl
- oxycarbonyl-ethyloxy-(1-methoxy-3-(methacrylatemethyl)-4-nitro)phenyl.

69. (new) Adhesive composition as in claim 60, characterized in that the bifunctional monomer is chosen from among:

- Poly(1-(3'-carboxyphenyl)-3-,3-di(2''hydroxyethyl)triazene),
- Poly(1-(3'-carboxy-6'-methylphenyl)-3-,3-di(2''-hydroxyethyl)triazene)
- Poly(1-(4'-carboxyphenyl)-3-,3-di(2''-hydroxyethyl)triazene),
- Poly(1-(3',5'-dicarboxyphenyl)-3-(2''-hydroxyethyl)-3-methyl-triazene),
- Poly(1-(3'-carboxyphenyl)-3-,3-di(2''-hydroxyethyl)triazene-co-2,2-bis(hydroxymethyl)propionic acid),
- Poly(1-(3'-carboxy-6'-methylphenyl)-3-,3-di(2''-hydroxyethyl)triazene-co-2,2-bis(hydroxymethyl)propionic acid),
- Poly(1-(4'carboxyphenyl)-3-,3-di(2''hydroxyethyl)triazene-co-2,2-bis(hydroxymethyl)propionic acid),

$\omega$ -functionalized by methacrylate ends with methacrylic acid and its derivatives, such as 2-hydroxyethylmethacrylate, glycidyl

methacrylate or 2-isocyanatoethyl methacrylate for example, or oxirane ends of glycidyl type by reaction with an epihalohydrine for example.

70. (new) Adhesive composition as in claim 61, **characterized in** that the bifunctional monomer is chosen from among:

- Poly(2,2-bis(hydroxymethyl)propionic acid -co-1-(3'-carboxyphenyl)-3-,3-di(2''-hydroxyethyl)triazene),
- Poly(2,2-bis(hydroxymethyl)propionic acid -co-(3'-carboxy-6'-methylphenyl)-3-,3-di(2''-hydroxyethyl)triazene),
- $\omega$ -functionalized by methacrylate ends with methacrylic acid and its derivatives, such as 2-hydroxyethylmethacrylate, glycidyl methacrylate or 2-isocyanatoethyl methacrylate for example, or by oxirane ends of glycidyl type by reaction with an epihalohydrine for example.
- Poly(2,2-bis(hydroxymethyl)propionic acid),  
 $\omega$ -functionalized by an oxycarbonyl-3-[3'-(2''-(methacrylate)ethyl)triazene]phenyl group or an -oxycarbonyl-ethyl oxy-(1-methoxy-3-(methacrylatemethyl)-4-nitro)phenyl group.

71. (new) Adhesive composition as in claim 40, **characterized in** that the photoinitiation means for radical or cationic polymerization reaction comprise at least one species able to cause their photo-sensitization.

72. (new) Adhesive composition as in claim 40, **characterized in** that the photoinitiation means for radical polymerization reaction also comprise a co-initiator.

73. (new) Adhesive composition as in claim 72, **characterized in** that the photoinitiation means for radical polymerization reaction

consist of the following photoinitiator/co-initiator pair:  
camphorquinone / tertiary amine.

74. (new) Adhesive composition as in claim 40, **characterized in**  
that the photoinitiation means for radical polymerization reaction  
consist of a photoinitiator which is a bis-acyl of phosphine oxide.

75. (new) Adhesive composition as in claim 39, **characterized in**  
that the initiation means of the chain polymerization reaction(s) are  
of chemical type.

76. (new) Bifunctional monomer including firstly a  
photocleavable centre comprising at least one photocleavable unit,  
and secondly at least two polymerizable units linked by covalent  
skeletons to said photocleavable centre and positioned either side of  
the cleavage site or sites of said photocleavable centre,  
**characterized in** that it is of oligomer or prepolymer size and has a  
comb branched structure consisting of a principal linear polymer  
chain of which each of the comb branches contain at least one  
photocleavable unit positioned on the side of the principal chain and  
at least one polymerizable unit positioned on the free end of the  
branch, the photocleavable units being chosen from the aryldiazos  
defined in claim 41 by formula I.

77. (new) Bifunctional monomer including firstly a  
photocleavable centre comprising at least one photocleavable unit and  
secondly at least two polymerizable units linked by covalent  
skeletons to said photocleavable centre and positioned either side of

the cleavage site or sites of said photocleavable centre, characterized in that it is of oligomer or prepolymer size and has a hyperbranched structure obtained by polycondensation or polyaddition of precursor monomers of AB<sub>2</sub> or AB<sub>3</sub> type.

78. (new) Bifunctional monomer as in claim 77, characterized in that the hyperbranched structure has a core consisting of photocleavable units and a peripheral shell consisting of inert units from a photochemical viewpoint.

79. (new) Bifunctional monomer as in claim 77, characterized in that the hyperbranched structure has a core consisting of photochemically inert units, and a peripheral shell comprising photocleavable units.

80. (new) Method for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit chosen from among the aryltriazenes defined in claim 46 by formula II, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprising a synthesis step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, characterized in that the synthesis step of an aryltriazene photocleavable unit consists of:

- conducting diazotation in inert organic medium in the

presence of a Lewis acid of type  $\text{BF}_3$ , or  $\text{PF}_5$ , or  $\text{SbF}_5$  and of an organic nitrite,

- then conducting diazoic coupling by adding a compound comprising at least one primary or secondary amino group, in a dissociating organic medium in the presence of a mineral compound of sodium carbonate, potassium carbonate or sodium hydrogenocarbonate type.

81. (new) Method for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprises a synthesis step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, **characterized in** that it comprises a creation step to create polymerizable units of vinyl type on the photocleavable centre, consisting of the creation of acryloyl functions by nucleophilic substitution on an acryloyl carbon.

82. (new) Method for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprises a synthesis

step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, **characterized** in that it comprises a grafting step to graft vinyl type polymerizable units onto the photocleavable centre, consisting of grafting the vinyl function included in a molecule comprising at least one reactive function (F1) onto the chemical skeleton of the photocleavable centre, and also comprising at least one other reactive function (F2), by causing these two functions to react via a nucleophilic substitution mechanism on an acyl type carbon.

83. (new) Method as in claim 82, **characterized** in that one of the two reactive functions (F1,F2) is an OR group or an -OOCR group.

84. (new) Method for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprises a synthesis step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, **characterized** in that it comprises a grafting step to graft vinyl type polymerizable units onto the photocleavable centre, consisting of grafting the vinyl function included in a molecule comprising at least one reactive function (F1) onto the chemical skeleton of the photocleavable core, and also comprising at least one other reactive

function (F2), by causing these two functions (F1, F2) to react to form a carbamate bond.

85. (new) Method for preparing a bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, said method successively comprises a synthesis step of the photocleavable centre, a structural arrangement step of the photocleavable centre, and an association step associating the polymerizable units with the photocleavable centre, **characterized** in that it comprises a grafting step to graft vinyl type polymerizable units onto the photocleavable centre, consisting of grafting the vinyl function included in a molecule comprising at least one reactive function (F1) onto the chemical skeleton of the photocleavable centre, and also comprising at least one other reactive function (F2), by causing these two functions (F1, F2) to react to form a  $\beta$ -hydroxyester bond through attack by a carboxylate anion on an oxirane under conditions of nucleophilic catalysis, more particularly in the presence of catalysts carrying tertiary amino or quaternary ammonium groups.

86. (new) Method for preparing a bifunctional monomer of oligomer or prepolymer size as in claim 77, **characterized** in that function A being a carboxylic acid function and function B an alcohol or amino function, the polycondensation or polyaddition reaction of the precursor monomers of  $AB_2$  or  $AB_3$  type is conducted in the presence

of dehydrating agents.

87. (new) Method as in claim 86 **characterized** in that the dehydrating agents are chosen from among: 1-methyl-2-chloropyridinium iodide, dicyclohexylcarbodiimide, N,N'-diisopropylcarbodiimide, N,N'-carbonyldiimidazole, 1,1'carbonylbis(3-methylimidazolium) triflate, di-2-pyridyl carbonate, 1-hydroxybenzotriazole, an acylation agent of Pyridine/Tosyl Chloride type or SOCl<sub>2</sub>/DMF.

88. (new) Method for preparing a bifunctional monomer of oligomer or prepolymer size as in claim 77, **characterized** in that function A being an ester function and function B an alcohol or amino function, the transesterification reaction of the precursor monomers of AB<sub>2</sub> or AB<sub>3</sub> type is preferably conducted in the presence of catalysts such as titanates, organic tin oxides and esters, using basic catalysis in the presence of non-ionic bases providing soft operating conditions such as amines, amidines, guanidines, triamino(imino)-phosphoranes.

89. (new) Use of the photosensitive adhesive composition as in claim 39 for various clinical applications in the area of dentistry, in particular to bond elements to the surface of teeth and/or to seal tooth cavities.

90. (new) Bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site

or sites of said photocleavable centre, **characterized** in that it is of oligomer or prepolymer size and has a comb branched structure consisting of a principal linear polymer chain of which each of the comb branches contain at least one photocleavable unit positioned on the side of the principal chain and at least one polymerizable unit positioned on the free end of the branch, the photocleavable units being chosen from the 2-nitrobenzyls defined in claim 47 by formula 1.

91. (new) Bifunctional monomer including firstly a photocleavable centre comprising at least one photocleavable unit, and secondly at least two polymerizable units linked by covalent skeletons to said photocleavable centre and positioned either side of the cleavage site or sites of said photocleavable centre, **characterized** in that it is of oligomer or prepolymer size and has a comb branched structure consisting of a principal linear polymer chain of which each of the comb branches contain at least one photocleavable unit positioned on the side of the principal chain and at least one polymerizable unit positioned on the free end of the branch, the photocleavable units being chosen from the 2-nitrobenzyls defined in claim 48 by formula 2.